

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years

Number: 515.2A - HVAC System

Title: Complete Replacement of Heating System
(New boilers, new hot water converters and new hot water pumps)

Cost: FY 94: \$651,000 FY 98: \$887,000

DESCRIPTION:

The existing heating system for this building consists of three 150 horsepower steam boilers and one 450 horsepower steam boiler installed when the building was originally constructed. Each of these boilers is of the gas-fired type and are natural draft, low pressure, steam boilers. Each boiler is equipped with an induced draft fan to provide for positive venting of flue gases. Steam is provided to all parts of the building for heating and for domestic hot water heating. These boilers also serve to provide steam for heat to the 421 Gold Building and to the 123 Fourth Street Building. There is a steam to hot water converter located in the boiler room with associated hot water pumps, expansion tanks, etc., to provide heating water to the 500 Gold Building. There are two condensate return tanks approximately 1000 gallons size and five feedwater pumps.

This work item consists of removing the three 150 horsepower steam boilers, the one 450 horsepower steam boiler, two 1,000 gallon condensate tanks, five boiler feedwater pumps, all of the modulating feedwater controls and valves, boiler breaching, steam piping, condensate piping, feedwater piping, and all associated controls etc., located in the boiler equipment room in the basement of the building. This work item also includes installation of new equipment to replace that which is removed in addition to new steam to hot water heat exchangers, heating water circulating pumps, heating water system expansion tanks and heating water piping within the boiler room. The new boilers will be reconnected to the gas piping system and will be forced draft type gas boilers that will produce low pressure steam, similar to the existing boilers. The low pressure steam will be used in the domestic hot water heat exchangers and the new heating water heat exchanger to produce the domestic hot water of the building and heating water for the new air handling units identified in Work Item 515.1A.

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Number: 515.2A - HVAC System

DESCRIPTION:

Also, the new boilers and heating water system will be tied into and controlled by the existing Building Automation Control System. Conversion of the existing steam heating systems to hot water will result in steam only being delivered within the mechanical equipment room and to the two buildings east of the mechanical equipment room. All of the heating for the 517 Gold Building will then be provided by a hot water circulating system.

JUSTIFICATION:

The existing steam heating plant is approximately 35 years of age, since it was installed when the building was built in 1960. The boilers are gas-fired, natural draft, low pressure steam boilers. They are fairly inefficient due to the fact that they have natural draft type burners. All of the steam and condensate piping within the building and inside the mechanical equipment room is approximately the same age of the boilers and does show signs of deterioration. The existing controls for the boilers are 1960 vintage, pneumatic industrial controls and need to be replaced and connected to the electronic Building Automation System.

Justification for the change to hot water heating system for the 500 Gold Building is based solely on energy conservation. First, energy is conserved by utilizing lower temperature heating median, 180° water in lieu of 240° steam. Second, energy conservation is attained due to better control of the hot water heating medium. The control valves which are available for water control allow for almost linear control for proportional application of heat. The existing steam controls are very hard to modulate and do not provide linear type control. Also, the change over from steam heating to hot water heating eliminates all of the steam traps in the building which are a maintenance problem, as well as energy wasters.

ASSOCIATED WORK ITEMS:

Refer to Work Item 515.2B for Practical Upgrade of the System.

Refer to Work Item No. 515.1A for Conversion of the Air Handler Unit Heating System to Hot Water.

Refer to Work Item No. 515.3B for Conversion of perimeter Radiation System to Hot Water.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW

Building No.: NM0024ZZ

Location: Albuquerque, New Mexico

Number: 515.2A – HVAC System

Title: Complete Replacement of the Heating System
New Boilers, Heating Converters and Heating Pumps

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$134,044	\$134,044
LPS Boilers – 150 HP F.D. Gas	3	EA	\$35,000	\$105,000
LPS Boilers – 450 HP F.D. Gas	1	EA	\$70,000	\$70,000
Condensate Tanks	2	EA	\$4,250	\$8,500
Feedwater Pumps	5	EA	\$3,200	\$16,000
Modulating Feedwater System	4	EA	\$3,500	\$14,000
Boiler Breeching	4	EA	\$2,500	\$10,000
Steam/HW Heat Exchangers	2	EA	\$8,500	\$17,000
Heating Water Pumps	2	EA	\$4,200	\$8,400
Heating Water Exp. Tanks	2	EA	\$1,250	\$2,500
Heating Water Piping	200 (61.0)	LF (M)	\$32	\$6,400
Steam Piping	200 (61.0)	LF (M)	\$64	\$12,800
Condensate Piping	200 (61.0)	LF (M)	\$26	\$5,200
Feedwater Piping	200 (61.0)	LF (M)	\$26	\$5,200
Breeching Insulation	3200 (975.4)	SF (M)	\$2	\$6,400
Gas Piping	200 (61.0)	LF (M)	\$20	\$4,000
System Commissioning	1	EA	\$29,140	\$29,140
System Test and Balance	1	EA	\$14,570	\$14,570
Subtotal				\$469,154
Mark-Up – 15% Contingency				\$70,373
Mark-Up – 18% Overhead and Profit				\$84,448
N.M. Gross Receipts Tax at 5.8125%				\$27,270
Total E.C.C.				\$651,244
Total E.C.C. (rounded)				\$651,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years ____

Number: 515.2B - HVAC System

Title: Practical Upgrade of Steam System
(New boilers, steam heating)

Cost: FY 94: \$550,000 FY 98: \$749,000

DESCRIPTION:

Refer to Work Item 515.2A for description of existing system.

This work item consist of replacing the four existing steam boilers, condensate tanks, feed water pumps, modulating feed water control system and boiler breachings.

This is a practical upgrade, since it replaces the existing steam heating system with a similar steam heating system. Again, it is recommended that the replacement boilers be force-draft, natural-gas boilers, instead of natural draft.

JUSTIFICATION:

All of the steam heating equipment including the boilers, feedwater pumps, condensate tanks, etc. are approximately 35 years of age and are near the end of their useful life. All of the equipment needs to be replaced with up-to-date equipment, including force-draft boilers for energy conservation and for better maintenance.

ASSOCIATED WORK ITEMS:

Refer to Work Item 515.2A for Complete Upgrade and Replacement of the System with Hot Water Heating System.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW

Building No.: NM0024ZZ

Location: Albuquerque, New Mexico

Number: 515.2B – HVAC System

Title: Practical Upgrade of Heating System
New Boilers – Steam Heating

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$113,206	\$113,206
LPS Boilers – 150 HP F.D. Gas	3	EA	\$35,000	\$105,000
LPS Boilers – 450 HP F.D. Gas	1	EA	\$70,000	\$70,000
Condensate Tanks	2	EA	\$4,250	\$8,500
Feedwater Pumps	5	EA	\$3,200	\$16,000
Modulating Feedwater System	4	EA	\$3,500	\$14,000
Boiler Breeching	4	EA	\$2,500	\$10,000
Steam Piping	100 (30.5)	LF (M)	\$64	\$6,400
Condensate Piping	100 (30.5)	LF (M)	\$26	\$2,600
Feedwater Piping	200 (61.0)	LF (M)	\$26	\$5,200
Breeching Insulation	3200 (297.3)	SF (SM)	\$2	\$6,400
Gas Piping	100 (30.5)	LF (M)	\$20	\$2,000
System Commissioning	1	EA	\$24,610	\$24,610
System Test and Balance	1	EA	\$12,305	\$12,305
Subtotal				\$396,221
Mark-Up – 15% Contingency				\$59,433
Mark-Up – 18% Overhead and Profit				\$71,320
N.M. Gross Receipts Tax at 5.8125%				\$23,030
Total E.C.C.				\$550,004
Total E.C.C. (rounded)				\$550,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years

Number: 515.3A - HVAC System

Title: Practical Upgrade of Steam Radiation System

Cost: FY 94: \$171,000 FY 98: \$233,000

DESCRIPTION:

The existing steam radiation system consists of steam radiators located under the windows on the exterior walls of the building. This system is divided into four zones; north, east, south and west with temperature controls that turn the system into one complete zone at a time for all eight floors. The units are steam convectors which were installed when the building was first constructed.

This work item consists of replacing the existing control valves and controls for the steam radiation heating system and re-piping the steam radiators to provide multiple-zone controls. There will be six zones of control required for the radiation system on each of the floors; two north zones, two south zones, a west zone and an east zone for each floor. The radiation systems will have to be re-piped in order to accommodate control valves for each of these zones. The temperature controls will be upgraded to operate on the new zone basis with a new temperature controller located in each of the zones.

JUSTIFICATION:

The steam radiation heating system operates adequately. However, there are overheated areas of the building when the radiation system is turned on. This is due to the fact that there are only four zones of control for the entire building; north, south, east and west. Therefore, each of the eight floors gets heat in any one of the zones whether it needs it or not. Therefore, energy conservation is one of the main criteria for revising the controls to the steam radiation system. Also, building comfort levels will be maintained more appropriately and, the system can be utilized more of the time with individual floor by floor and exposure controls.

ASSOCIATED WORK ITEMS:

Refer to Work Item No. 515.3B for Conversion of Radiation Heating System to Hot Water.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW
 Building No.: NM0024ZZ
 Location: Albuquerque, New Mexico

Number: 515.3A – HVAC System

Title: Practical Upgrade of Steam Radiation System

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$35,089	\$35,089
Steam Piping – 8" with Insulation	80 (24.4)	LF (M)	\$66	\$5,280
Steam Piping – 6" with Insulation	100 (30.5)	LF (M)	\$46	\$4,600
Steam Piping – 4" with Insulation	100 (30.5)	LF (M)	\$34	\$3,400
Steam Piping – 3" with Insulation	100 (30.5)	LF (M)	\$28	\$2,800
Steam Piping – >3" with Insulation	100 (30.5)	LF (M)	\$22	\$2,200
Control Valves – 2"	48	EA	\$450	\$21,600
Condensate Piping – 2" with Insulation	200 (61.0)	LF (M)	\$22	\$4,400
Steam Traps	128	EA	\$250	\$32,000
System Commissioning	1	EA	\$7,628	\$7,628
System Test and Balance	1	EA	\$3,814	\$3,814
Subtotal				\$122,811
Mark-Up – 15% Contingency				\$18,422
Mark-Up – 18% Overhead and Profit				\$22,106
N.M. Gross Receipts Tax at 5.8125%				\$7,138
Total E.C.C.				\$170,477
Total E.C.C. (rounded)				\$171,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years

Number: 515.3B - HVAC System

Title: Complete Replacement of the Perimeter Radiation System (with hot water)

Cost: FY 94: \$275,000 FY 98: \$375,000

DESCRIPTION:

Refer to Work Item 515.3A for description of the existing system.

This work item would include controls similar to that indicated in the previous work items (515.3A) for the steam radiator system. This item would also include replacement of all the steam radiators with new hot water, finned-tube radiation. This item would be accomplished along with the conversion of the building heating system to hot water in lieu of steam.

JUSTIFICATION:

The hot water system would provide the opportunity for better temperature control of the zone heating system produced by the perimeter radiation. The new finned tube radiators would replace the existing steam radiation units, simply due to the age of the existing equipment. Use of lower temperature heating water compared to steam would result in energy conservation, due to less overheating of the spaces from the lower temperature media.

ASSOCIATED WORK ITEMS:

Refer to Work Item No. 515.3A for Control of the Radiation System.
Refer to Work Item No. 515.2A for Conversion of the Heating System to Hot Water.
Refer to Work Item No. 515.1A for Conversion of Air Handling System to Hot Water Heat.

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW
 Building No.: NM0024ZZ
 Location: Albuquerque, New Mexico

Number: 5153B – HVAC System

Title: Complete Upgrade of Perimeter Radiation System

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$56,488	\$56,488
Water Piping – 6" with Insulation	200 (61.0)	LF (M)	\$44	\$8,800
Water Piping – 4" with Insulation	400 (121.9)	LF (M)	\$32	\$12,800
Water Piping – 3" with Insulation	600 (182.9)	LF (M)	\$26	\$15,600
Water Piping – >3" with Insulation	400 (121.9)	LF (M)	\$20	\$8,000
Control Valves – 2"	48	EA	\$450	\$21,600
Finned Tube Radiation	7000 (2,133.6)	LF (M)	\$8	\$56,000
System Commissioning	1	EA	\$12,280	\$12,280
System Test and Balance	1	EA	\$6,140	\$6,140
Subtotal				\$197,708
Mark-Up – 15% Contingency				\$29,656
Mark-Up – 18% Overhead and Profit				\$35,587
N.M. Gross Receipts Tax at 5.8125%				\$11,492
Total E.C.C.				\$274,443
Total E.C.C. (rounded)				\$275,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years

Number: 515.4 - HVAC System

Title: Replacement of Relief Exhaust Fans

Cost: FY 94: \$184,000 FY 98: \$251,000

DESCRIPTION:

The existing relief air system consists of a Brown Instruments Control System, which is a totally pneumatic 1960's vintage controller, and a number of belt drive propeller fans. The propeller fans are sequenced ~~are~~ by the Brown Instruments Static Pressure Controller to provide relief air from the building through the two relief penthouses. Each of the propeller relief fans is equipped with a motorized damper which opens when the fan is operated. There is also a set of propeller type relief fans in the elevator penthouses of the building which are operated the same way as the relief air propeller fans. There are a number of exhaust fans around the building which provide exhaust service for the toilets, kitchen, etc.

This work item includes a replacement of all the existing propeller type relief fans and all of the existing utility set exhaust fans. Also included is a replacement of the existing control systems which cycle the relief fans and dampers. The fans will be replaced complete with control dampers and will also be installed with guards around the fans, motors and drives.

JUSTIFICATION:

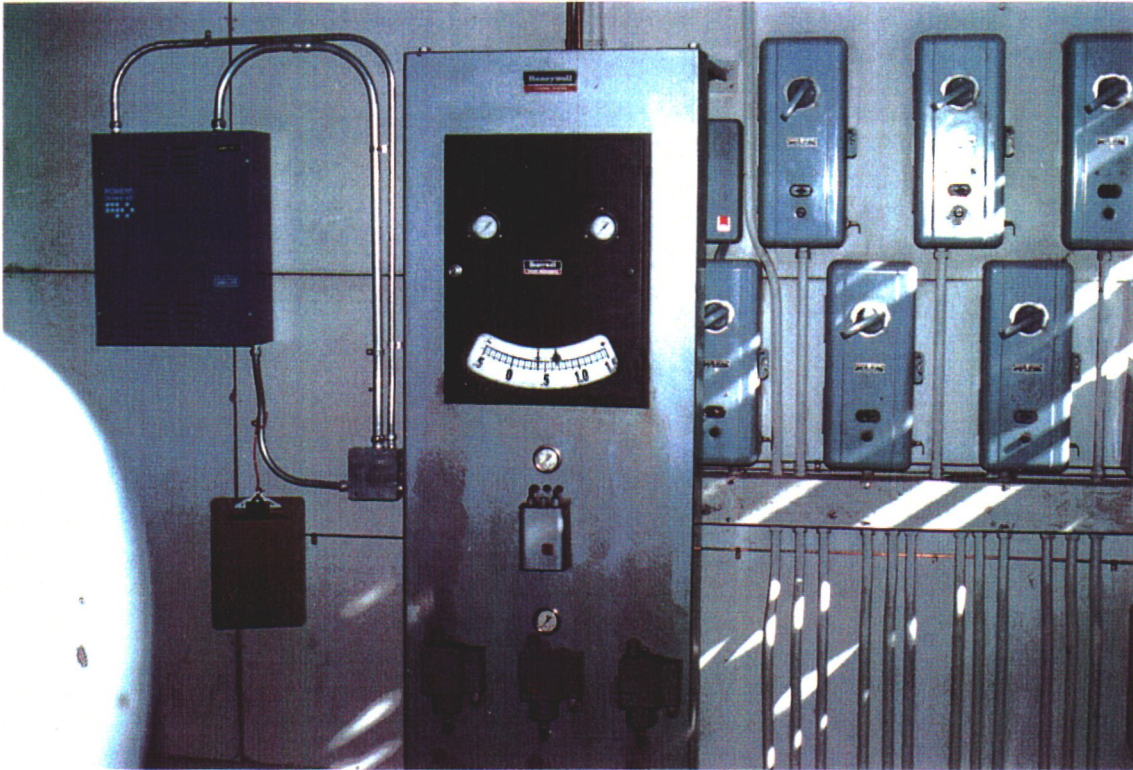
These fans are all approximately 35 years of age and are nearing the end of their life expectancy. Also, there is no personnel protection around any of the propeller fans and drives in accordance with OSHA requirements. The controls for the relief fans are 1960's vintage pneumatic industrial controls and it is hard to find replacement parts. New controls should be connected to the existing building automation system to operate these relief air fans.

ASSOCIATED WORK ITEMS:

There are a no Associated Work Items.

BUILDING ENGINEERING REPORT

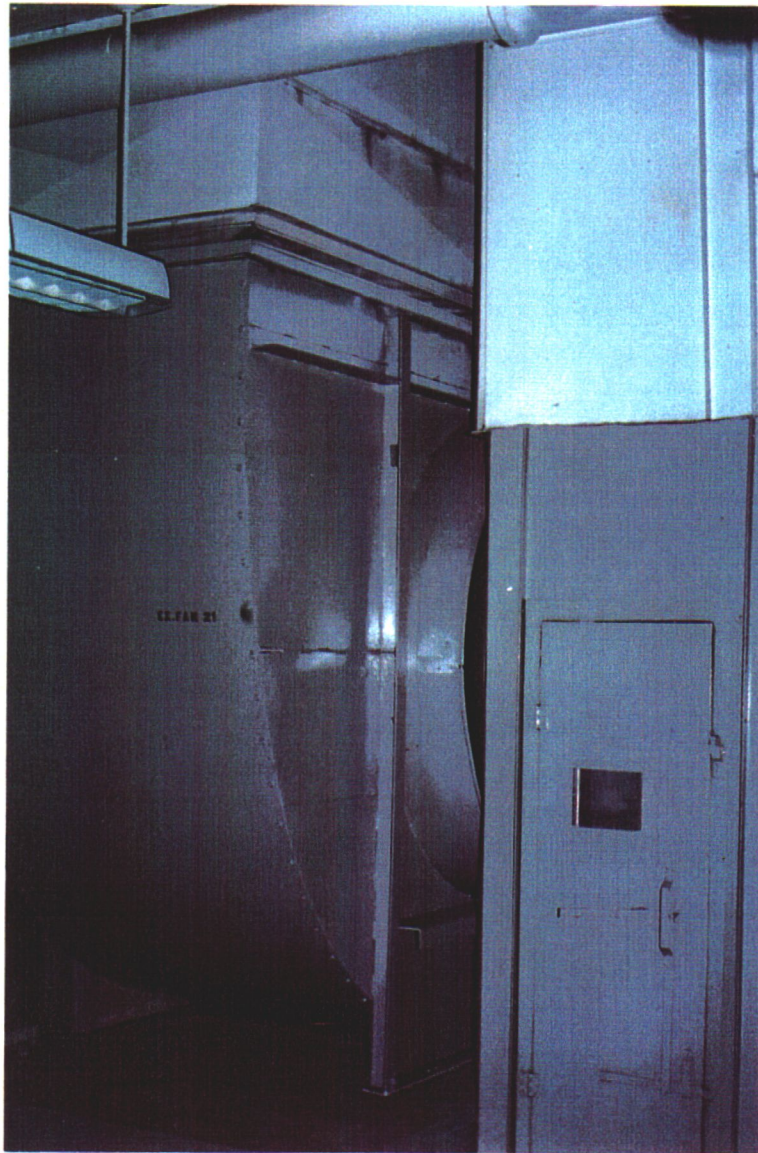
Building Name: Federal Building - 517 Gold Avenue SW
Building No.: NM0024ZZ
Location: Albuquerque, New Mexico



Relief Fan Controls

BUILDING ENGINEERING REPORT

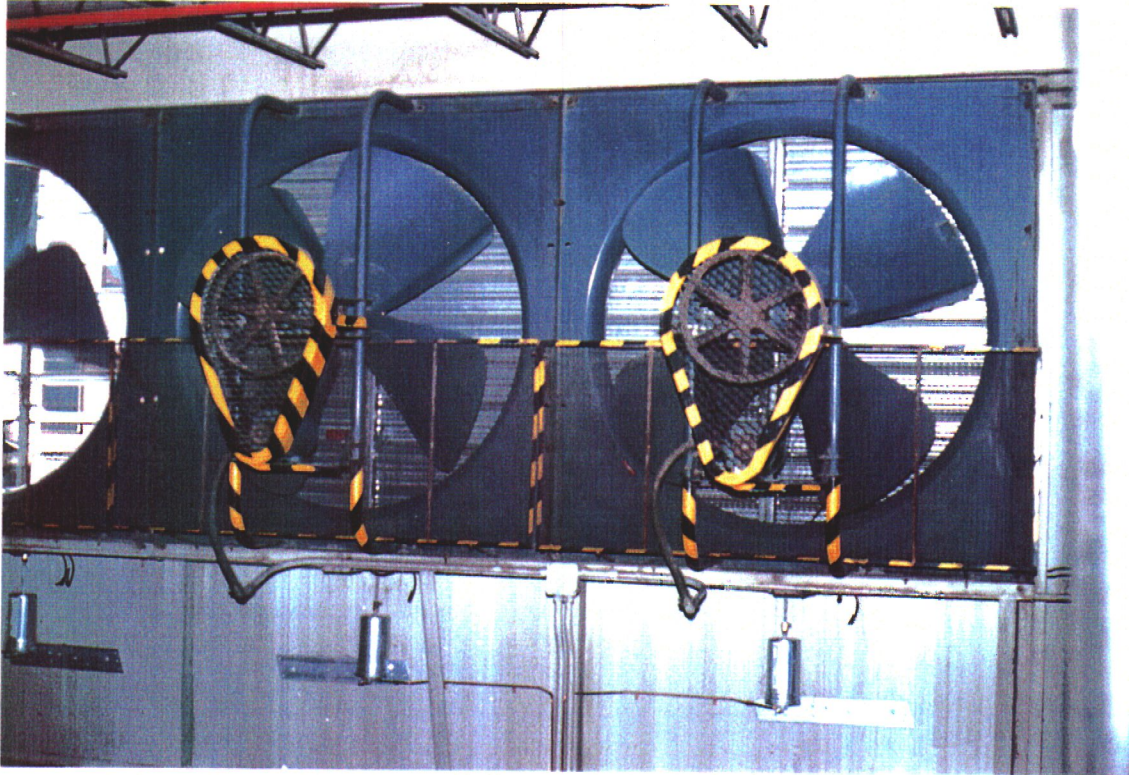
Building Name: Federal Building - 517 Gold Avenue SW
Building No.: NM0024ZZ
Location: Albuquerque, New Mexico



Exhaust Fan

BUILDING ENGINEERING REPORT

Building Name: Federal Building - 517 Gold Avenue SW
Building No.: NM0024ZZ
Location: Albuquerque, New Mexico



BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building – 517 Gold Avenue SW
Building No.: NM0024ZZ
Location: Albuquerque, New Mexico

Number: 515.4 – HVAC System

Title: Replacement of Relief and Exhaust Fans

DETAILED COST ESTIMATE

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
Removal of Existing	1	LOT	\$37,950	\$37,950
Propeller Relief Fans	18	EA	\$2,200	\$39,600
Utility Set Fans	3	EA	\$3,500	\$10,500
Add Fire Dampers	30	EA	\$250	\$7,500
Relief Fan Controls	3	EA	\$3,500	\$10,500
Control Dampers	18	EA	\$800	\$14,400
System Commissioning	1	EA	\$8,250	\$8,250
System Test and Balance	1	EA	\$4,125	\$4,125
Subtotal				\$132,825
Mark-Up – 15% Contingency				\$19,924
Mark-Up – 18% Overhead and Profit				\$23,909
N.M. Gross Receipts Tax at 5.8125%				\$7,720
Total E.C.C.				\$184,378
Total E.C.C. (rounded)				\$184,000

BUILDING ENGINEERING REPORT (BER)

Building Name: Federal Building - 517 Gold Avenue SW
Building No: NM0024ZZ
Location: Albuquerque, New Mexico

WORK ITEM: Action required within 5 years X Action required within 5-20 years ____

Number: 616.1 - Handicapped Accessibility

Title: Provide New Equipment to Facilitate Handicapped Accessibility

Cost: FY 94: \$18,000 FY 98: \$25,000

DESCRIPTION:

A. Existing items of compliance are as follows:

1. Two existing handicapped ramps both located at secondary access points of the building. One ramp is located at the interior of the west entry. The other ramp is located at the exterior north side of the building, adjacent to handicapped parking near a loading dock. The main entry on the south side of the building is not handicapped accessible.

B. Existing items of non-compliance that need to be addressed are as follows:

1. The existing signage needs to be raised/brailled characters are pictorial symbols. Typical locations for signage include ramps, restrooms, floor lobby directory, exit stair doors, and telephones.
2. The existing restrooms and adjacent drinking fountains need to comply for accessibility. The plumbing upgrade and the restroom finishes are covered in WI 460.2 and 460.4 respectively.
3. The existing doors adjacent to handicapped ramps need to be made automatic operating with the press of a button or by a detection system.
4. The pay telephones for public use need to be accessible and provision for use by people with hearing loss.

JUSTIFICATION:

It is requested to make this facility fully accessible to persons with disabilities.

ASSOCIATED WORK ITEMS:

Refer to Work Item 460.2 for upgrade of plumbing system.

Refer to Work Item 460.4 new restroom finishes and accessories.